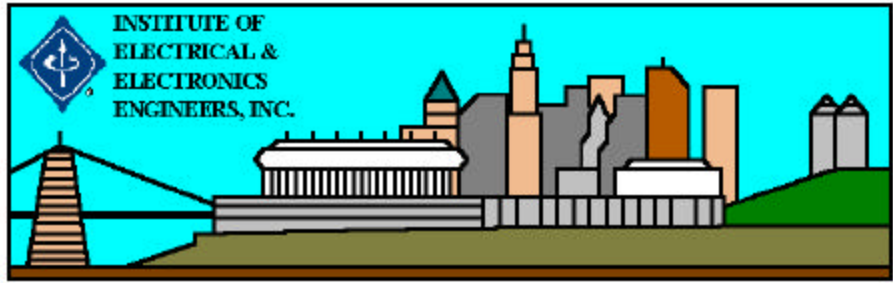


**IEEE CINCINNATI
SECTION
NEWSLETTER
OCTOBER 2001**



**OCTOBER
MEETING**



LASER SAFETY - ROCKWELL LASER

DATE: Thursday, October 25, 2001

PLACE : Raffles – 10160 Reading Road (see below for directions)

TIME : 5:30 p.m. to 7:00 p.m. - Social Time/Dinner
7:00 p.m. to 8:30 p.m. - Program

COST FOR DINNER: \$15.00 which includes a buffet dinner, soft drinks/coffee, tax & gratuity.
Cost for student members - \$10.00

Raffles offers a wide selection of entrees, salads, soups, side dishes and desserts. There is also a bar available for the purchase of alcoholic drinks. It is located at 10160 Reading Road, south of Glendale-Milford Road on the east side of Reading. Take I-75 to the Glendale-Milford Rd. Exit, go east on Glendale-Milford Road approximately 3/4 of a mile to Reading Rd. and turn right on Reading.

Please call the Cincinnati Section Voice Mailbox at 513-629-9380, by **Noon, Tuesday, October 23, 2001** if you plan to attend. Please leave your **Name, IEEE Member Number,** and **a daytime telephone number.**

ABOUT THE MEETING: The presentation by Rockwell Laser covers laser safety requirements in the most common type of laser environments and is based upon the ANSI Z136.1 Standard along with relevant Federal (CDRH & OSHA) and State requirements. The presentation will provide an introduction to laser safety at an entry-level basis. The safety aspects will be applicable for those that operate, service and maintain lasers. The basics of lasers will include beam output descriptions including units of measurement. Techniques of safety will be presented and reinforced using demonstrations, where appropriate. Laser bioeffects will be covered including discussions of laser accidents with examples. The concepts of laser hazard classes will be covered. Basic hazard analysis will conclude with eyewear filter (OD) and hazard distance (NHZ) determinations. The presentation concludes with a review of controls needed for safe laser operation.

More details are on the Section's Web Page at: <http://ieee.cincinnati.fuse.net/>

TO SUBSCRIBE TO THE ELECTRONIC NEWSLETTER

This newsletter is only available via e-mail or the Section's web page at <http://ieee.cincinnati.fuse.net/> with the exception of new Section members (one issue only) or members who have specifically requested a copy be delivered through the U. S. Mail.

If you are a new Section member and would like to get this newsletter electronically, please contact Bob Morrison (Editor) at **513-287-3697** or by e-mail at j.r.morrison@ieee.org. Provide your name and member number. In case there are questions, please include a daytime telephone number as well.

If you would like the "Snail Mail" version, you must contact Bob Morrison via the above means or call the Section's voice mail at **513-629-9380**.

CHAIR'S MESSAGE

by Tom Grau, Section Chair

First, let me begin by expressing our deepest, heartfelt sympathy for all the victims and their families in the terrorist attacks on September 11. We pray that our country will return to normal soon and that all the necessary steps that need to be taken will be taken to bring those responsible for this senseless act to justice.

On September 27, 2001, our speaker was Randy Holt who discussed a concept he called "Ecodesign." These are a set of design rules established initially which if properly invoked will render an electronic design that has a minimal effect on our environment when the product comes to its end of life. Randy, please accept our thanks and appreciation for a job well done.

There are several openings on the Executive Committee and I urge you to volunteer to help conduct the business of our Section. Please contact me at (513) 899-3181 or E-Mail to T.GRAU@IEEE.ORG.

ATTENTION Retired Engineers and Scientists!

Consider RESC Activities !

The **Retired Engineers and Scientists of Cincinnati - RESC** for short - invite those with **technical back- grounds** who are **retired** and would like to **share good fellowship** while **pursuing interests** in technology, community, history and nostalgia, travel, and business or industry developments.

Activities include monthly **luncheon meetings**, periodic **plant tours**, and **golf** in season. Luncheon meetings are held on the third Tuesday of each month from October through May.

VIEW THE FULL SCHEDULE AT: **<http://RESC-Online.org>**

LUNCHEON MEETING SCHEDULE -
(at UNITY CENTER) OCTOBER through JANUARY

OCTOBER LUNCHEON MEETING

Tuesday, October 16 **Luncheon meeting at Unity Center, 1401 East McMillan St. - Side entrance on Grandview Ave. to lower level - Reservations required by **October 10, 2001.****
11:30AM

Program: **COMPASS - Master Plan & Strategies for Hamilton County**
Speaker: **Steve Johns, Planner, Hamilton County Regional Planning Commission**
will describe COMPASS, a planning process applying modern technology, demographic trends, and the teamwork of officials and citizens to develop a unified vision for the communities under 49 jurisdictions within the county.

NOVEMBER LUNCHEON MEETING

Tuesday, November 20 **The Baltic States - Then and Now**
11:30 AM **Dr. Carl F. and Marjorie Evert, Past President of RESC and wife**, both of whom have taught at many of the area's universities in fields of Electrical and Computer Engineering and Corporate Finance will summarize their Elderhostel Tour program, which explored the history and culture of each country in the 50 years of occupation and recovery, as well as modern day Finland and St. Petersburg, Russia.

DECEMBER LUNCHEON MEETING

Tuesday, December 18 **"Mothers and Other Heroes" by Laura Pulfer**
11:30AM **The popular columnist of the Cincinnati Enquirer, author, and commentator on NPR** will be the featured speaker for the traditional RESC pre-holiday luncheon which is especially tailored for enjoyment of spouses & ladies. She will be introducing her new book as a sequel to "I Beg to Differ".

JANUARY LUNCHEON MEETING

Tuesday, January 15 **Canada - Our Northern Neighbor**
11:30 AM **Russell Knowling, Lecturer, UC Institute of Learning in Retirement**, who has studied and taught in Australia, England, Canada, and the USA will lead us westward across Canada from Newfoundland to British Columbia with not just tourist features but the history, geography, and philosophy which distinguish the Provinces, and prepare you for personal exploration.

PLANT TOUR SCHEDULE - OCTOBER through JANUARY

NOTE: Attendance on tours may be limited

NOVEMBER PLANT TOUR

Tuesday, November 6 **Cincinnati Water Works Intake and Filtration Plant**
10:00 AM Compare the modern intake with the original steam powered pumps, and inspect

the modern chemical treatment and filtration facilities.

Followed by lunch at the **Sky Galley Restaurant**

DECEMBER PLANT TOUR

Tuesday, December 4

Motoman Inc. (robotics), West Carrolton, Ohio

10:00 AM

As company headquarters, this plant includes their advanced systems development, testing, and training. Learn about robot evolution. See robots performing laser cutting and three dimensional welding. Also, see robots designed for clean rooms in semiconductor industry, for deflashing plastic parts, and for welding on Humvee vehicles.

Followed by lunch at **El Rancho Grande**

Event Attendance REQUIRES Advance Reservations: Contact **Gene Anderson**, phone (513) 353-2708

General information about RESC and supplemental information about events
is available on website: <http://RESC-online.org>

Scanning the Past: A History of Electrical Engineering from the Past

Submitted by Dick Reiman, Historian

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William R. Hewlett

Late this month, William R. Hewlett, cofounder of the Hewlett-Packard Company and former president of the Institute of Radio Engineers (IRE), is to be inducted into the National Inventors Hall of Fame in Akron, Ohio. This Hall of Fame was established in 1973 with Thomas A. Edison as the first inductee. Subsequently, other eminent inventors from the electrical field have joined Edison in the Hall of Fame, including Alexander Graham Bell, Nikola Tesla, Lee de Forest, Edwin Armstrong, Harold Black, Jack Kilby, and Robert Noyce.

Hewlett was nominated for his invention of a variable frequency oscillator which employed a resistance-capacitance tuning circuit and a nonlinear negative feedback circuit to stabilize the output amplitude. His oscillator provided the original impetus for the formation in 1939 of a company which was to become one of the world's foremost in precision electronic instrumentation. The commercial version of the oscillator achieved a reputation as one of the most outstanding products in the electronics instrumentation industry, and it remained on the market in a succession of models until 1985.

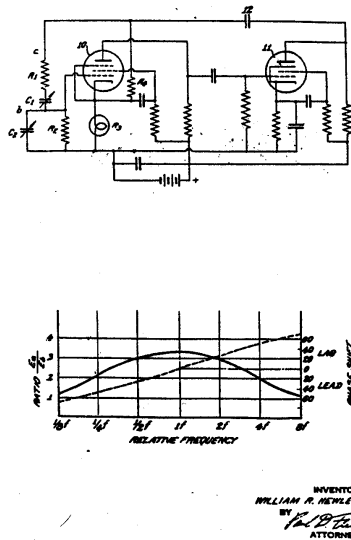


Figure 1. In 1939, a graduate student named William Hewlett applied for it patent on a resistance-capacitance tuned VFO. As the cliché goes, the rest is history. The schematic diagram and performance curves of the oscillator, taken from the patent application, are shown in the figure.

Hewlett was born in Ann Arbor, Michigan, in 1913 where his father taught at the University of Michigan. In 1916, his father accepted a teaching position at Stanford University in California. Hewlett studied electrical engineering at Stanford, where he first met David Packard, a fellow student. Hewlett graduated from Stanford in 1934 and then enrolled at the Massachusetts Institute of Technology, where he completed a Master's degree in 1936. At the invitation of his mentor, Frederick E. Terman, Hewlett returned to Stanford and received an advanced degree in electrical engineering in 1939. The same year he applied for a patent on a variable frequency oscillator which employed a small incandescent lamp as part of a negative feedback circuit intended to maintain a stable output with minimum distortion. His patent was granted in January 1942, and he received two later patents covering improvements in the oscillator.

With the encouragement of Terman, Hewlett and Packard decided to form a partnership early in 1939, and they began operation with an initial capital of \$538 in a small garage in Palo Alto. One of their first customers was Walt Disney Studios, which ordered eight of the Hewlett oscillators, to use in producing the sound track for the film *Fantasia*. By the end of 1940, Hewlett-Packard had nine employees and an annual gross of \$37,000. During World War II, Hewlett served as a staff officer in the Army Signal Corps and in the U.S. War Department. In 1945, he returned to Hewlett-Packard and was named vice-president of the firm in 1947. Despite increased managerial responsibilities, he continued to invent and received several patents in microwave instrumentation.

From 1950 to 1957, Hewlett served on the board of directors of the IRE and was the IRE president in 1954. In 1964, he was named president of Hewlett-Packard and became chief executive officer of the company in 1969, a position he held until 1978. He played a leading role in the company's decision to diversify into the computer business beginning in 1969, and it was his decision which led to development of the famous HP-35 calculator. The Hewlett-Packard Company, which had been founded to develop and market Hewlett's oscillator, had approximately 82,000 employees and reported revenues of \$8.1 billion when Hewlett became director emeritus in 1987.

James E. Brittain
 School of History, Technology, and Society
 Georgia Institute of Technology

ELECTRICAL WORLD MAGAZINE

125th ANNIVERSARY

by Bob Morrison, Editor

In 1999, Electrical World Magazine celebrated their 125th anniversary as one of the premier publications for the Electric Power Industry. They presented a history of significant People, Companies, Industry Changes and Innovative Technologies which have served to define the current status of the Electric Power Industry. In the next few months, their article will be reprinted in this newsletter (*permission granted by McGraw-Hill Publishing Co.*)

PEOPLE

EDISON & TESLA

The 125-year history of the electric power industry is replete with stories of industrial pioneers and entrepreneurs that molded fledgling technologies into a world-transforming enterprise. Many of their stories are dotted with plot twists, colorful personalities, climaxes, and conflicts -- all making the history appear larger than life.

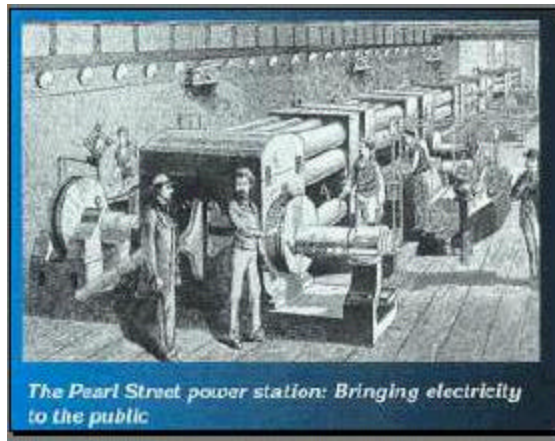


In fact, a central -- and industry defining -- clash drove a wedge between two electric giants, Thomas Edison and Nikola Tesla. At the crux: Whether to use direct current (dc) or alternating current (ac) to move electricity over transmission lines.

Edison's dc

The brilliance of Edison's incandescent lamp was not in the machine, but in the system he created to deliver electricity to the general public. Edison applied his dc system to lower Manhattan in 1881, introducing would-be electricity users to his Pearl Street power station, the world's first operative, large-scale, central generating facility.

The teaming of Edison's incandescent lamp and Pearl Street was the genesis of large-scale electricity demand. Furthermore, Pearl Street made electricity available and affordable to the masses, thereby changing forever the way people worked and played.



Tesla's ac

Nikola Tesla was said to be an eccentric European engineer who came to the US in search of what Edison captured: the American dream. A true genius, Tesla could completely formulate any theory in his mind; a talent that led to a crucial business misstep: He refused to file for patents.

Although an assistant filed almost all of Tesla's 111 patents, Edison filed for 1093 patents to usurp the Serbian scientist, in terms of commercial success. Still, it is Tesla's ac system that outlived Edison's dc invention. And today, ac remains the electric power industry's standard long-distance delivery system.

Despite Tesla's enduring contribution, he died poverty-stricken and alone, with little public recognition at the time of his death.

The feud

The feud between Edison and Tesla was sparked at their first meeting. Tesla arrived in the US from his native Serbia excited to meet the famed American and to discuss his ideas for a complete, polyphase alternating current system. What he found was an unresponsive and uninterested Edison. When Tesla proposed his ac system, Edison refused to listen. To demonstrate his capabilities, Tesla offered to improve the efficiency of Edison's dc dynamo by 25%. Edison skeptically promised him \$ 50,000 if Tesla could deliver on his promise. Tesla succeeded, but Edison reneged on the deal, claiming that he'd been joking. Furious, Tesla vowed never work with Edison again -- a competitive hostility that lasted a lifetime.

Success

Eventually, Tesla found backing for his ac system with George Westinghouse, who believed that ac held the potential for long-distance transmission. Working together, the two successfully lit the 1893 Chicago World's Fair using an ac system; in 1895, ac was used to transmit electricity generated by the power of Niagara Falls, to Buffalo, NY. Tesla called the late 1890s "the happiest time" in his life.

Though ac won the debate and became the industry standard, Edison never relented on his position. Some say his business interests, based on local electricity distribution, fueled his dc fervor. Others say he believed dc was the better technology. Regardless, Edison used a dc system to light his home and his factories.

There is one final tale that describes the intense rivalry between Edison and Tesla. November 1915 marked the first time that an American was slated to win the Nobel Prize. As reported that year by the New York Times on Nov 6: "The Swedish Government has decided to distribute the Nobel Prizes next week, as follows: Physics -- Thomas A Edison and Nikola Tesla."

But the nation would have to wait until 1923 to be awarded its first Physics Nobel Laureate (Robert Millikan). Allegedly, the Edison-Tesla rivalry was rooted so deeply, that neither was willing to share the prize.

Eventually, Tesla found backing for his ac system with George Westinghouse, who believed that ac held the potential for long-distance transmission

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If you are interested in placing an ad, or if you have questions, please contact:

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IEEE NEWS

September 17, 2001 - There is so much newly written on optical networking, that it can be a daunting task for a busy professional to keep up with the latest trends. IEEE Educational Activities Selected Readings books, Optical Networking I and II, deliver state-of-the-art information for practicing electrical and computer engineers. Each collection provides an overview of specific areas and papers describing the field in detail.

Dr. Mehmet Toy, editor of both volumes, has selected the best previously published papers on optical networking from prestigious journals and transactions of the last three years. The books are grouped by sub-topics and need not be read in order. Prefaces to the volumes are available for your inspection at www.ieee.org/organizations/eab/PDI/pages/courselist/preview.htm#O.

Optical Networking I provides readers with a collection of papers describing issues from optical components such as amplifiers to management of optical networks. Topics include:

- *Architectures for Wide and Local Area Networks
- *Key devices for building optical networks including MEMS
- *Architectures for cross connects and architectures for optical switches

Optical Networking II provides readers with knowledge on how to accommodate for the immense capacity of fiber optic needs. By using this material, engineers will know how to match fiber needs with switches, routers, and cross connects, as well as ways to support increasing traffic demands. Topics include:

- *Signaling and Routing
- *Scalability
- *Restoration
- *Quality of Service

This collation of materials will aid engineers in managing the huge growth of information in optical networking. It can also provide background for those engineers managing in the optical networks area. Toy has a strong background in Optical Networking with a Ph.D. in Electrical Engineering and years of accomplishments with AT&T, Lucent Technologies, and most recently, Axionwave Networks. His expertise assures readers that the volumes are filled with the most current quality materials.

To order, use the following product numbers:

Optical Networking I #SR 118, member: \$75.95, list: \$89.95
Optical Networking II #SR 119, member: \$75.95, list: \$89.95

IEEE Customer Service Department, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331, USA; e-mail: customer-service@ieee.org; phone: 1-800-678-4333 (USA and Canada), 1-732-981-0060 (worldwide); Web: <http://shop.ieee.org/store> -- choose the button Education & Training for a complete list of EAB products.

The IEEE Cincinnati Section Executive Committee
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